

BROAD AGENCY ANNOUNCEMENT NR: 00-11-SNK

NOTE: THIS BAA ANNOUNCEMENT IN THE CBD/EPS TAKES PRECEDENCE OVER ANY INFORMATION PROVIDED IN ANY SUPPLEMENTAL WEBSITE.

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CBD ANNOUNCEMENT NR:
Broad Agency Announcement (BAA) NR 00-11-SNK

TITLE: Moving Target Feature Phenomenology for Track Maintenance (MTFPTM)

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CONTRACTING POC: Mr. John Stovall, AFRL/SNKR, (937) 255-5380, email: John.Stovall@wpafb.af.mil; AFRL/SNKR, or Mr. David Shellabarger, AFRL/SNKR, (937) 255-6307, email, David.Shellabarger@wpafb.af.mil. Mail address: Bldg 167, 2310 8th St., Wright-Patterson AFB, OH 45433-7801

PROPOSAL DUE DATE AND TIME: Proposals for Focused Research Topic (FRT) #1, "entitled Radar Signature Feature Research," for BAA 00-11-SNK, are due 10 Oct 00, 3:00 P.M. local time. (45 days after announcement in the CBD). No Proposals in any other Focused Research Topic will be accepted at this time. (See Introduction for additional information). *NOTE: Proposal receipt after the due date and time shall be governed by the provisions of FAR 52.215-1(c)(3).*

INTRODUCTION:

This is a two year open-ended Broad Agency Announcement (BAA) to solicit research proposals for the Moving Target Feature Phenomenology for Track Maintenance program (MTFPTM). Multiple contract awards and/or assistance instruments are anticipated with an estimated value of \$500K or less with typical periods of performance between 16-28 months, including final report preparation. The MTFPTM program is being initiated via release of this baseline BAA 00-11-SNK announcement and one Focused Research Topic (FRT) in the CBD/EPS with subsequent amendments for additional FRTs to be announced in the CBD at a later date. The baseline announcement describes the overall purpose and thrust of the program as well as presenting the initial research topic, called Focused Research Topic(s) (FRT), for the MTFPTM program. This announcement describes the baseline BAA announcement and SOLICITS RESEARCH PROPOSALS FOR ONLY FOCUSED RESEARCH TOPIC (FRT) #1 "RADAR SIGNATURE FEATURE RESEARCH" AT THIS TIME (see Section b. for details on FRT #1). Periodically over the two-year period (ending 30 Sep 02), subsequent amendments to the BAA/solicitation will be issued in the CBD/EPS (under the "Modifications" section) to request proposals for additional Focused Research Topics (FRTs) as new Focused topics are identified. These subsequent amendments will contain descriptions of research topics, or FRTs, to be addressed, anticipated period of performance, information peculiar to the specific FRT, and the expected dollar range for proposals received under the FRT. Once a subsequent amendment is issued in the CBD/EPS, offerors will have 30 calendar days from the announcement date in the CBD to submit proposals. Proposals will only be accepted for a FRT during the 30-day open proposal period for that specific FRT announced in the CBD/EPS amendment. Proposals received outside of the 30-day proposal period (i.e. an FRT already announced but the proposal due date has passed, or an FRT for which an amendment has not yet been issued) will not be reviewed and will be returned to the offeror. Multiple subsequent amendments are anticipated and may be announced sequentially or concurrently in the CBD/EPS. The Government reserves the right to re-issue a previously announced FRT with a second, subsequent proposal period.

OFFERORS MUST MONITOR THE CBD/EPS SYSTEM TO ENSURE THEY RECEIVE THE MAXIMUM PROPOSAL PREPARATION TIME FOR SUBSEQUENT AMENDMENTS AS THIS IS THE OFFICIAL NOTIFICATION FOR REQUEST OF PROPOSALS.

All proposals should be addressed to the Contracting Point of Contact (POC) stated above. Small businesses are encouraged to propose on all or any part of this solicitation. Proposals submitted shall be in accordance with this announcement. *There will be no other solicitation issued in regard to this*

requirement. Offerors should be alert for any BAA amendments that may permit extensions to the proposal submission date.

Potential offerors are notified that effective 01 Jun 1998, in order to be eligible to receive any DOD award, contractors must be registered in the Central Contractor Registration (CCR) Database, unless a contractor meets any of the exceptions of DFARS 204.7302. On-line registration instructions can be accessed from the Wright Research Site Contracting Office home page at <http://www.wrs.af.mil/contract/> or the DISA CCR home page at <http://www.ccr2000.com/>.

SECTION A: Statement of Problem/Objective:

1. Statement of Objective/Needs: (Note: Do not submit proposals for the Baseline Effort)

a. **BASLINE MTFPTM BAA SCOPE:** The overall objective of MTFPTM is to develop key technologies required to support the DARPA Affordable Moving Surface Target Engagement (AMSTE) program. Specifically, the objective of this effort is to conduct research and development of innovative concepts and techniques for the modeling, characterization, analysis, and exploitation of moving surface target features to address the critical technical challenges associated with supporting long-term track identification maintenance under challenging scenarios in support of the DARPA (AMSTE) phase II program. The AMSTE II objective is to develop, integrate and demonstrate system technologies required for the precision engagement of moving surface threats from long range, to maintain positive track on these targets and to rapidly engage these moving targets with stand-off weapons. Positive track requires the ability to maintain threat track from initial target nomination through engagement which is sufficiently robust to accomplish extended-duration tracking, perhaps using signature aided tracking techniques to disambiguate movers and maintain combat identification. The Moving Target Feature Phenomenology for Track Maintenance (MTFPTM) program is a DARPA sponsored joint research initiative with the AFRL Sensors Directorate to develop technology that augments the DARPA AMSTE. Supplemental information on the DARPA AMSTE program is provided at <http://www.darpa.mil/baa/PRDA-00-05-IFKPA.htm>

b. **FOCUSED RESEARCH TOPICS:** MTFPTM Focused Research Topics are to research and develop moving target tracking technology needs/issues/limitations/barriers. The Air Force Research Laboratory, Sensors Directorate, Wright Research Site is soliciting technical and cost proposals on the research effort described in the Focused Research Topics below:

MTFPTM FOCUSED RESEARCH TOPIC #1:

Research Area: Radar Signature Feature Research

This FRT may be viewed in detail by clicking on MTFPTM FOCUSED RESEARCH TOPIC# 1: above or by opening the attached EPS document FRT1.

c. Deliverables/Schedule/Other Requirements.

(1) Deliverable Items for all FRTs:

(a) **Data Items:** Data Items are identified in the attached EPS document Contract Data Requirements List, DD FORMS 1423. Contract Data Requirements List, DD Forms 1423 requirements are: 1) SCIENTIFIC AND TECHNICAL REPORTS, Final Report, DI-MISC-80711/T, ONE/TIME, 2) SCIENTIFIC AND TECHNICAL REPORTS, Contractor Billing Voucher, DI-MISC-80711/T, MONTHLY, 3) FUNDS AND MAN-HOUR EXPENDITURE REPORT, DI-FNCL-80331/T, MONTHLY, 4) PRESENTATION MATERIAL, DI-ADMN-81373/T, AS REQUIRED, 5) SOFTWARE TEST PLAN (STP), DI-IPSC-81438A/T, AS REQUIRED, 6) COMPUTER SOFTWARE PRODUCT END ITEMS (DATABASE), DI-MCCR-

80700/T, and 7) STATUS REPORT, DI-MGMT-80368/T to delete paragraph 10.2.2.1.b and paragraph 10.2.2.3, MONTHLY. Unlimited rights are required. Offeror must identify any restrictions on the type of data rights to be provided.

(b) Software: As identified or proposed on each FRT. Unlimited rights are required. Offeror must identify any restrictions on the type of rights to be provided with the software, documentation, etc.

(c) Hardware: None. Hardware deliverables are not anticipated unless otherwise specified in an FRT.

(2) Schedule for all FRTs:

(a) Overall effort: The anticipated period of performance for individual awards is between 16-28 months in duration. Each FRT amendment will identify the approximate period of performance for the research identified in the FRT. The period of performance is to be proposed in the format "includes XX months for technical effort, plus X months for the final report."

(b) Data Items: Delivery schedule shall be in accordance with DD Form 1423s, Contract Data Requirements Lists (CDRLs) and based upon the period of performance for the individual award.

(c) Software: As identified in the negotiated contract. The Government will expect negotiations to result in a delivery not later than the delivery of the final report for the individual award.

(d) Hardware: None anticipated, however, as identified in the negotiated contract. The Government will expect negotiations to result in a delivery not later than the delivery of the final report for the individual award.

(3) Security Requirements: Work performed under any resulting contracts or acquisition instruments may be classified up to and including SECRET level. SECRET facility and storage clearance requirements apply. The following Security Classification Guide is applicable to this program: TARGET ATTACK AND RECOGNITION AND INERTIAL REFERENCE AND GUIDANCE TECHNOLOGY PROGRAMS dated 18 JUN 2000

(4) Other Requirements for all FRTs:

(a) International Traffic in Arms Regulations (ITAR) (export control) applies.

(b) PL 98-94 (export control) applies.

(c) Government Furnished Property (GFP): The Government will provide high range resolution ground moving target data in a quality and quantity to be determined during the program kickoff meeting. There are currently available approximately 10,000 signatures of varying quality of four different targets and the offeror should address data limitations in the proposed effort.

(d) The government's preference, when using a contract (as opposed to an assistance instrument), is to obtain unlimited rights (as defined by DFARS 252.227-7013 "Rights in Technical Data — Noncommercial Items") to the results and products of this research. Any proposed research that will restrict the government's rights, and the degree to which those rights will be restricted, shall be clearly delineated in the proposal.

SECTION B: Award Information

1. Expected Award Dates: Awards from FRT# 1 are anticipated approximately 22 December 00.
2. Anticipated budget for the entire 2 year MTFPTM program (not per award):

FY01: \$3,500,000 FY02: \$1,400,000 Total: \$4,900,000 *This funding profile is an estimate only and is not a promise for funding as all funding is subject to change due to Government discretion and availability.*
3. Type of Contract/Instrument: The anticipated contract type for awards under this BAA is Cost Plus Fixed Fee, which requires awardees to have an approved accounting system. The Air Force reserves the right to award a contract or an assistance instrument. See Section D below.
4. Multiple awards are anticipated in each Focused Research Topic area.
5. Inter-government Personnel Act (IPA) employee(s) may be used during the evaluation process. IPA employees are subject to Conflict of Interest Laws and Standards of Conduct provisions, such as rules on disclosure of proprietary information.

SECTION C: Proposal Preparation Instructions

1. General Instructions:

a. Offerors should apply the restrictive notice prescribed in the provision of FAR 52.215-1(e) Instructions to Offerors--Competitive Acquisition. Technical/management and cost volumes should be submitted in separate volumes, and must be valid for 180 days. Proposals must reference the above BAA announcement number and specific Focused Research Topic (FRT) number. Offerors must submit one original and 2 paper copies and 2 electronic copies of their proposals. Each electronic copy must be submitted on one 3.5" disk or 100 MB Iomega Zip disk and the file format must be readable by Microsoft Word 97. Proposals sent by fax or email will not be accepted. *Offerors are advised that only contracting officers are legally authorized to contractually bind or otherwise commit the government.* The cost of preparing proposals in response to this BAA is not considered an allowable direct charge to any resulting or any other contract; however, it may be an allowable expense to the normal bid and proposal indirect cost as specified in FAR 31.205-18.

b. This is an unrestricted solicitation, except for no foreign participation due to International Traffic in Arms Regulations (ITAR), and all responsible domestic sources may submit proposals under full and open competitive procedures. This acquisition involves data that are subject to export control laws and regulations. Only contractors who are registered and certified with the Defense Logistics Services Center (DLSC) and have a legitimate business purpose may participate in this solicitation. Contact the Defense Logistics Services Center, 74 Washington Avenue N., Battle Creek, Michigan 49917-3084 (1-800-352-3572) for further information on the certification process. You must submit a copy of your approved DD Form 2345, Military Critical Technical Data Agreement, with your proposal.

2. Technical/Management Proposal:

The following describes the minimum requirements for responses to the BAA solicitation/amendments. The proposal(s) submitted in response to FRT #1 (and subsequent FRT amendments) shall include a discussion of the nature and scope of the research and the technical approach.

The technical proposal total page count is limited to 50 pages. The technical proposal shall consist of a 1-page cover page, an Executive Summary, description of the technical approach and relevant

capabilities, an unclassified, non-proprietary Statement of Work, and resumes of Principal Investigator and Key Personnel as described below. A TECHNICAL PROPOSAL TEMPLATE HAS BEEN PROVIDED BELOW. PROPOSALS MUST BE SUBMITTED IN ACCORDANCE WITH THE TEMPLATE FORMAT. ALL PROPOSALS SUBMITTED IN ANY OTHER FORMAT WILL BE RETURNED TO THE OFFEROR AS NON-COMPLIANT. The proposal sections listed below shall be clearly marked and presented in the order indicated.

Proposal Format

The technical portion of the proposal shall consist of the following:

Section	Content
A	A one page cover page including BAA number and FRT #, title, area(s) addressed by the proposal, technical and administrative points of contact including addresses, telephone numbers, electronic mail addresses (if any), and facsimile machine numbers must accompany every proposal. Contact information, project schedule, and summary cost information must be included on the cover page. Offerors may provide an opaque cover in front of this page if desired.
B	An executive summary of the proposed effort. The executive summary shall be prepared such that it completely summarizes the proposal and could stand on its own if it were the only document a decision-maker were to read. Please do not restate the problem in the executive summary, but focus on addressing the solution.
C	<p>An unclassified, non-proprietary statement of work (SOW) detailing the scope of the proposed work and specific deliverables. The SOW must be suitable for incorporation into the award document. At a minimum, the statement of work shall contain the following three sections:</p> <p style="padding-left: 40px;">C.1 - Objective: a brief overview of the technology area and what is to be accomplished.</p> <p style="padding-left: 40px;">C.2 - Scope: a statement of what the SOW covers including the area to be investigated, objectives/goals, and major milestones. Key elements of the scope are task development and production of deliverables.</p> <p style="padding-left: 40px;">C.3 - Task/Technical Requirements: a description of tasks, which represent the work to be performed, developed in an orderly progression and in enough detail to establish the feasibility of accomplishing the overall program goals.</p> <p><i>Note: Do not include any proprietary information in the SOW. Do not put specific schedule dates or months after contract award into the SOW. You can identify these in your technical proposal/schedule.</i></p>
D	<p>A description of the technical approach and qualifications, capabilities, and demonstrated achievements of the prime/subcontractors with sufficient detail to permit assessment of the proposal against the evaluation criteria listed in Section D, Basis for Award. The offeror's approach for transitioning the developed technologies into capabilities for military forces should also be included in this section. Additional information on prior work in this area, descriptions of available equipment, and data and facilities shall be included in this section. Offerors are expected to have existing research facilities/capabilities to perform the proposed effort. Resumes of the Principal Investigator and Key Personnel for the prime and subcontractor shall be provided. Resumes are included in the 50-page limit.</p> <p>The following guidance is provided to aid in the process of developing a proposal for MTFPTM.</p> <ol style="list-style-type: none"> 1. MTFPTM is interested in the research and development of technology to support

	<p>long-term track identification under challenging wartime scenarios.</p> <p>2. Deliverable items will be based upon the offeror's response to the FRTs. At a minimum, each offeror should anticipate monthly reports and a final report as required deliverables.</p> <p>3. Other Requirements:</p> <p>Researchers should describe how they will investigate in depth a single concept related to any one of the topics listed in an FRT announcement. Broad, multiple topic proposals or proposals to conduct literature searches or reviews are discouraged. In response to FRTs, researchers should develop the concept that they propose thoroughly. The project should:</p> <ul style="list-style-type: none"> • Present a complete discussion of the ramifications, technical challenges, benefits, technical risks, and technical/computational/networking costs related to their concept. • Describe how their research promotes positive target track. • Present a thorough discussion of how their solution applies to correcting the technical problem addressed in their research. • Provide a discussion and description of the methodology used to evaluate the effectiveness of the solution. • Provide a discussion of an approach to simulating and evaluating the solution to the technical issue addressed by their research. • Discuss the technical issues associated with implementing and evaluating their proposed simulation approach. This should include the data requirements and impacts to the effort if inadequate data is available • Discuss the impacts of ITAR restrictions. • Discuss the impacts of the unlimited data and software rights requirement.
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a. Page Limitation: The technical proposal is limited to 50 pages, not including the cover page (1 page max). The government will not consider pages in excess of this limitation. For readability, most text based information should be in 12 point (or larger) Times New Roman or Times, though other fonts and sizes may be utilized as necessary in tables, headings, drawings, art, etc. The proposal should have 1-inch margins, double-spaced, single-sided, on paper-size of 8.5 by 11 inches, and all paragraphs should be fully justified. The electronic copies of the proposals shall be submitted compatible with Microsoft Word 97. All other files will not be acceptable and will be destroyed unread. Any versions of MS Word that can be opened and read by Word 97 are acceptable. Reviewers will not load software or simulations in the conduct of proposal evaluations. Innovative approaches to information presentation are encouraged. Proposals shall include the name, address, voice phone number, facsimile number, and email address of the proposing organization, the principal point of contact and the FRT # to which the response is submitted. The proposal shall also include the names of other organizations participating as part of the research team.

b. Any questions concerning the technical proposal or SOW preparation shall be referred to the Technical POC cited above.

3. Cost/Business Proposal:

Separate the proposal into a business section and cost section. Adequate price competition is anticipated. The business section should contain all business aspects to the proposed contractual or instrument arrangements, such as type of contract/instrument, and any information not technically related, etc. Provide rationale for exceptions. If selected for award, qualifying offerors may be required to submit a subcontracting plan. Cost proposals have no page limitations; however, offerors are requested to keep cost proposals to 25 pages as a goal. The proposal shall be furnished with supporting schedules and shall contain a person-hour breakdown per task.

SECTION D: Basis for Award

The selection of one or more sources for award will be based on an evaluation of each offeror's proposal (both technical and cost/price aspects) to determine the overall merit of the proposal in response to the announcement. The technical aspect, which is ranked as the first order of priority, shall be evaluated based on the following criteria that are of descending importance:

TECHNICAL:

- a. Sound and innovative technical approach:

The overall scientific and technical merit will be assessed and the technical value of the development/experimentation approach will be evaluated for clarity and thoroughness. The proposed effort will also be assessed as to how it applies new/existing technology in a new way that is advantageous to the MTFPTM program objectives.

- b. Knowledge and understanding of HRR waveforms and concomitant processing

The proposal will be assessed as to how knowledgeable the offeror is of HRR technology and his understanding of limitations and possible extension to the target-tracking problem.

- c. Knowledge and understanding of target tracking and target recognition algorithms

The proposal will be assessed as to how knowledgeable the offeror is of target tracking and target recognition technology and his understanding of limitations and possible extension to the scenario of interest target tracking problem.

- d. Offeror's Capabilities and Related Experience

The qualifications, capabilities, and demonstrated achievements of the proposed principals and other key personnel for the primary/subcontractor organizations will be assessed against the Government's anticipated requirements. The offeror's proposed existing facilities and equipment will also be assessed against the Government's anticipated requirements.

- e. Compliance with Requirements

The contractor's proposal will be evaluated against the requirement to hold information generated under this effort as ITAR. Additionally, the proposal will be evaluated against the requirement to provide all data and software with unlimited rights.

COST/PRICE

Cost/Price includes the reasonableness and realism of the proposed cost and fee and consideration of proposed budgets and funding profiles. Cost/Price is a substantial factor, but ranked as the second order of priority.

No other evaluation criteria will be used. The technical and cost proposals will be evaluated at the same time. The Air Force reserves the right to select for award of a contract or assistance instrument any, all, part or none of the proposals received. Award of a grant to universities or nonprofit institutions, or assistance instrument in lieu of a contract will be subject to the mutual agreement of the parties. The government also reserves the right to award any resulting contract pursuant to the Research and Development Standard Contract format in DFARS 235.70.

SECTION E: OTHER INFORMATION TO OFFERORS:

a. An Ombudsman has been appointed to hear concerns from offerors or potential offerors during the proposal development phase of this acquisition. The purpose of the Ombudsman is not to diminish the authority of the program director or Contracting Officer, but to communicate Contractor concerns, issues, disagreements, and recommendations to the appropriate government personnel. When requested, the Ombudsman shall maintain strict confidentiality as to the source of the concern. The Ombudsman does not participate in the evaluation of proposals or in the selection decision. Interested parties are invited to contact Lt. Col. Sam A. Lopez, AFRL/PK, telephone (937) 255-4813, e-mail sam.lopez@wpafb.af.mil . All routine communication concerning this acquisition should be directed to the contracting POC.

b. Based upon market research, the Government is not using the policies contained in Part 12, Acquisition of Commercial Items, in its solicitation for the described supplies or services. However, interested persons may identify to the contracting POC their interest and capability to satisfy the Government's requirement with a commercial item within 15 days of this notice.

c. To ask a general, non-proprietary technical or informational question regarding an open FRT amendment, send an Email message to the Technical POC and an answer will be returned via Email. Questions of a proprietary nature may be mailed to Mr. Martin Justice, 2241 Avionics Circle, Wright Patterson AFB, OH 45433-7321 with a cover letter copy only to the Contractual POC. Please mark written correspondence proprietary, as appropriate. Clearly identify in the Subject line of your Email/Letter the MTFPTM topic area and MTFPTM FRT number on the BAA announcement within the program to which your question refers. Email is the preferred method for offerors to use when asking technical or administrative questions. Contractual inquiries can be directed to the e-mail address identified in the BAA.

This solicitation seeks proposals for the following Focused Research Topic (FRT)

MTFPTM FOCUSED RESEARCH TOPIC (FRT) # 1:

Focused Research Topic: Radar Signature Feature Research

Three basic questions that the first FRT must address are: 1) are there features in radar target returns that are exploitable for helping to maintain track continuity in the face of occlusion, crossing tracks, and move-stop-move, 2) how persistent or stable are these features, and 3) how well do they separate or discriminate between target tracks? Some specifics that must be addressed for each of these basic questions are:

- 1) Acquisition of a suitable set(s) of modeled, compact range, or measured moving ground target data. Development of a synthesis capability to provide multiple target classes at full aspect, multiple depression angles, and multiple velocities for existing measured data. Extraction of features sets at a level of fidelity suitable for analysis and evaluation for feature aided tracking and track maintenance. Examples of features that might be extracted from existing measured, compact range, and synthetic data are RCS, electrical length, HRR complex and magnitude profiles, and complex range Doppler.
- 2) Development of new techniques for characterizing and analyzing features to properly assess their utility for target tracking and recognition, including empirical, statistical, and physics-based techniques. Initial characterization will be based on empirical methods conducted on existing data sets and will be representative of a target set size of at least 18 targets over a limited range of operating conditions. Statistical characterization and analysis will be on a smaller set over a greater range of operating conditions. Statistical analysis will be conducted on a sufficiently large data set which is representative of the targets of interest.
- 3) Determine the extent in which these stable features sufficiently discriminate between tracks for sufficient duration as to support long duration track maintenance under complex scenarios. Separability characteristic(s) should be mathematically and physics-based modeled to support performance prediction in data sparse experiments.

Since much of the existing data were not collected to specifically facilitate track maintenance research, one of the products of the analysis work will be recommendations for future data collections using modeled, compact range or measured data collections. Recommendations should take into consideration the different radar and platform performance capabilities and associated performance constraints.

Application of this technology to operational systems requires extensive evaluation and performance prediction to justify transitional effort. Therefore, there exists the need for an initial data-independent effort to predict performance through physics-based data and performance modeling for validation via data driven performance evaluation. The government will participate in the development of Measures Of Performance /Measures Of Effectiveness (MOPs/MOEs) for multi-platform track maintenance based on the analysis study results. Obvious products of this effort are recommendations to improve existing simulations by estimating simulation parameter settings using measured/empirical data and subsequently generating scenarios that reflect the measured/empirical data.

Up to six awards in the range of \$500,000 are expected.